12. Troubleshooting

12-1 Items to be checked first

1. The input voltage should be rating voltage ±10% range.
   The air conditioner may not operate properly if the voltage is out of this range.

2. Is the link cable linking the indoor unit and the outdoor unit linked properly?
   The indoor unit and the outdoor unit shall be linked by 5 cables.
   Check the terminals if the indoor unit and outdoor unit are properly linked by the same number of cables.
   Otherwise the air conditioner may not operate properly.

3. When a problem occurs due to the contents illustrated in the table below it is a symptom not related to the malfunction of the air conditioner.

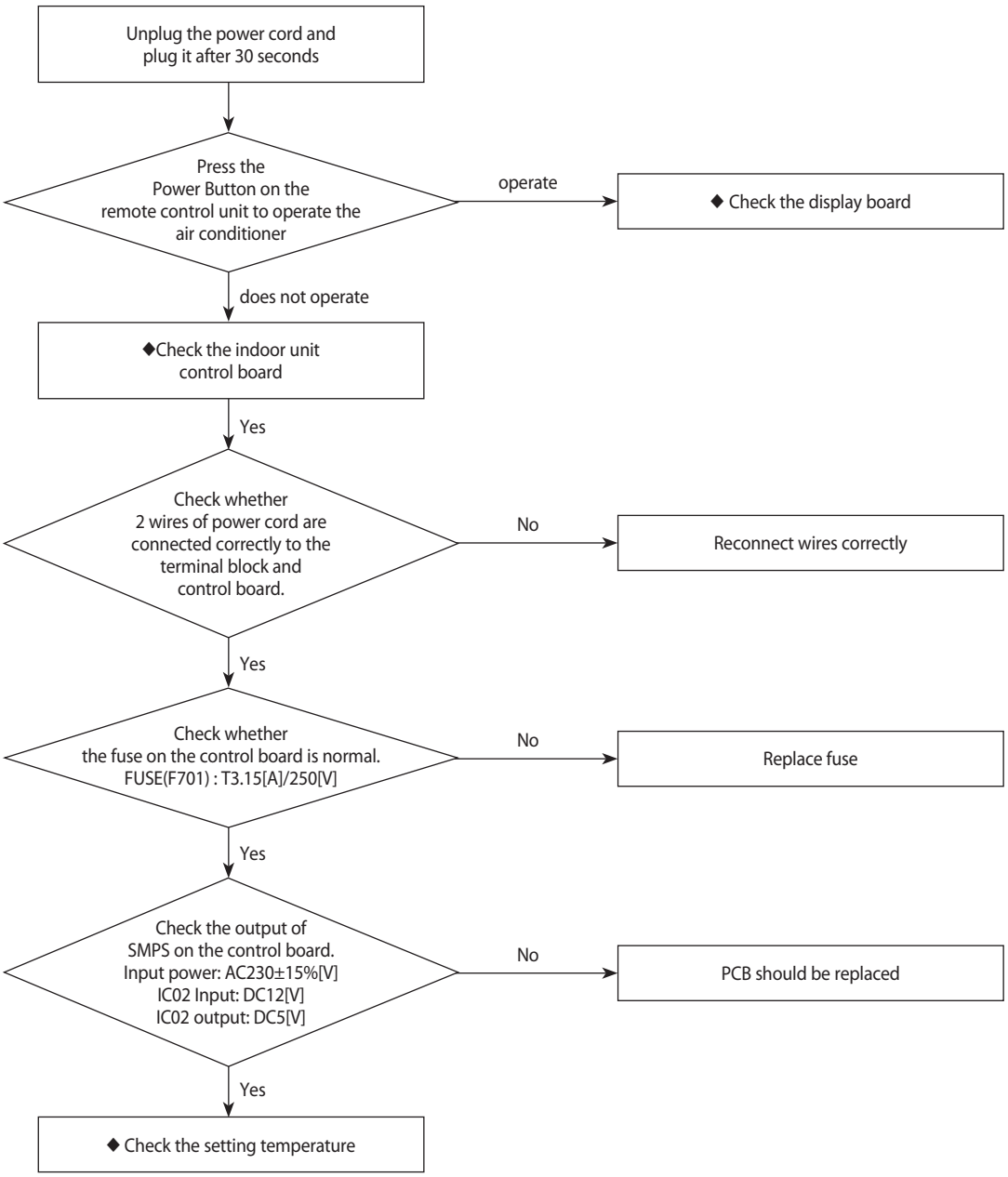
No	Operation of air conditioner	Explanation
1	The OPERATION indication LED(BLUE) blinks when a power plug of the indoor unit is plugged in for the first time.	It indicates power is on. The LED stops blinking if the operation ON/OFF button on the remote control unit is pushed.
2	In a COOL operation mode, the compressor does not operate at a room temperature higher than the setting temperature that the INDOOR FAN should operate. **[In case of heat pump model]** In a HEAT operation mode, the compressor does not operate at a room temperature lower than the setting temperature that indoor fan should operate.	In happens after a delay of 3 minutes when the compressor is reoperated. The same phenomenon occurs when a power is on. As a phenomenon that the compressor is reoperated after a delay of 3 minutes, the indoor fan is adjusted automatically with reference to a temperature of the air blew.
3	Fan speed setting is not allowed in DRY mode.	The speed of the indoor fan is set to LL in DRY mode. Fan speed is selected automatically in AUTO mode.
4	Compressor stops operation intermittently in DRY mode.	Compressor operation is controlled automatically in DRY mode depending on the room temperature and humidity.
5	Timer LED(ORANGE) of the indoor unit lights up and the air conditioner does not operate.	Timer is being activated and the unit is in ready mode. The unit operates normally if the timer operation is cancelled.
6	The compressor stops intermittently in a COOL mode or DRY mode, and fan speed of the indoor unit decreases.	The compressor stops intermittently or the fan speed of the indoor unit decreases to prevent inside/outside air frozen depending on the inside/outside air temperature.
7	**[In case of heat pump model]** Compressor of the outdoor unit is operating although it is turned off in a HEAT mode.	When the unit is turned off while de-ice is activated, the compressor continues operation for up to 9 minutes(maximum) until the deice is completed.
8	**[In case of heat pump model]** The compressor and indoor fan stop intermittently in HEAT mode.	The compressor and indoor fan stop intermittently if room temperature exceeds a setting temperature in order to protect the compressor from overheated air in a HEAT mode.
9	**[In case of heat pump model]** Indoor fan and outdoor fan stop operation intermittently in a HEAT mode.	The compressor operates in a reverse cycle to remove exterior ice in a HEAT mode, and indoor fan and outdoor fan do not operate intermittently for within 20% of the total heater operation

12-2 Fault Diagnosis by Symptom

12-2-1 No Power (completely dead)-Initial diagnosis

1. Checklist :
   1) Is input voltage normal?
   2) Is AC power linked correctly?
   3) Is input voltage of DC regulator IC KA7805 (IC02) normal? (11VDC-12.5VDC)
   4) Is output voltage of DC regulator IC KA7805 (IC02) normal? (4.5VDC-5.5VDC)

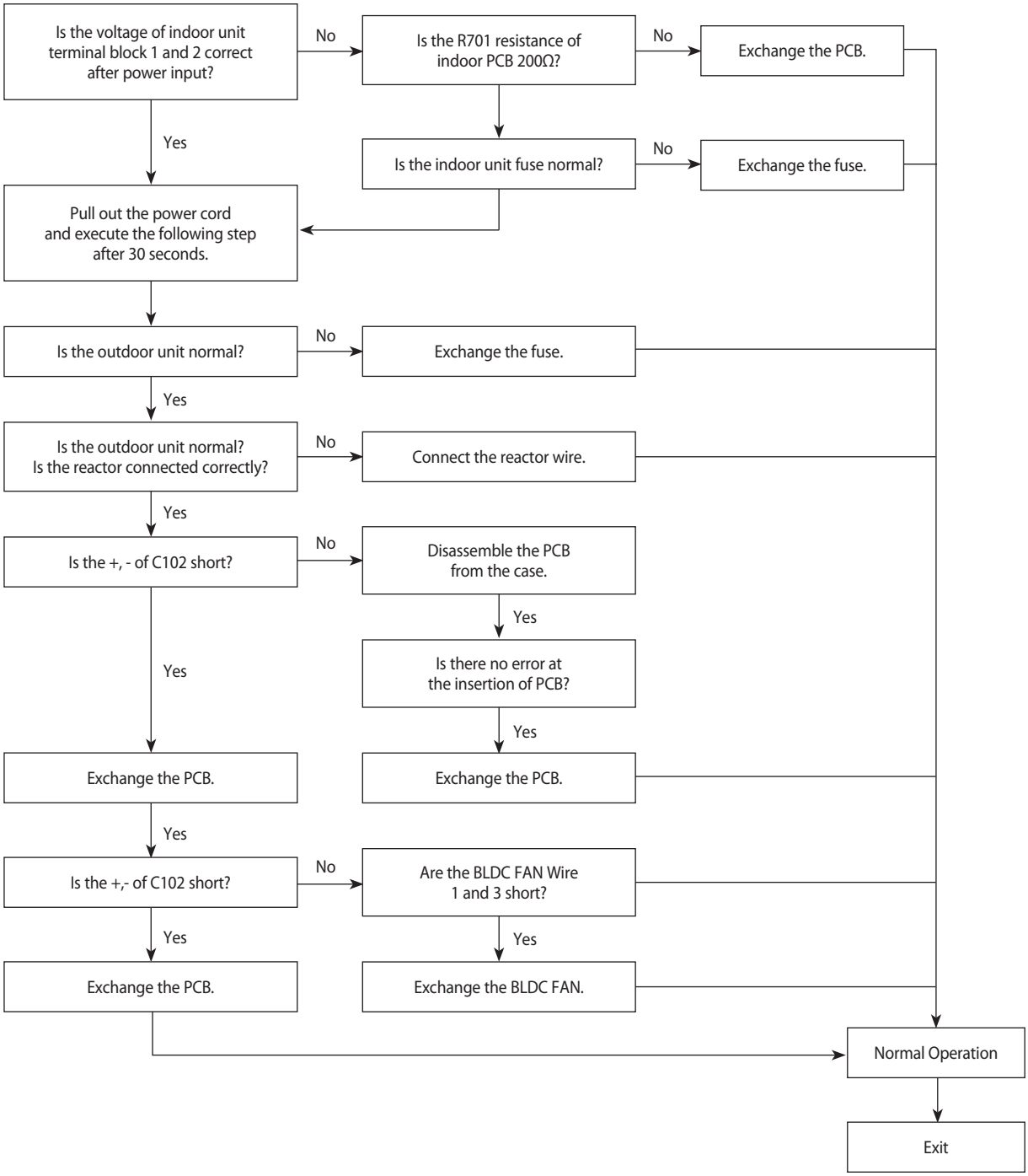
2. Troubleshooting procedure


Unplug the power cord and plug it after 30 seconds
Press the Power Button on the remote control unit to operate the air conditioner
operate
◆ Check the display board
does not operate
◆Check the indoor unit control board
Yes
Check whether 2 wires of power cord are connected correctly to the terminal block and control board.
No
Reconnect wires correctly
Yes
Check whether the fuse on the control board is normal. FUSE(F701) : T3.15[A]/250[V]
No
Replace fuse
Yes
Check the output of SMPS on the control board. Input power: AC230±15%[V] IC02 Input: DC12[V] IC02 output: DC5[V]
No
PCB should be replaced
Yes
◆ Check the setting temperature

12-2-2 The Outdoor unit power supply error

1. Checklist :
   1) Are the input power voltage and the power connection correct?
   2) Is there no Fuse short in the indoor unit and outdoor unit?
   3) Is the cable connected correctly between the indoor unit and outdoor unit in order.
   4) Is the wire connected correctly to the terminal block of the indoor unit and outdoor unit?

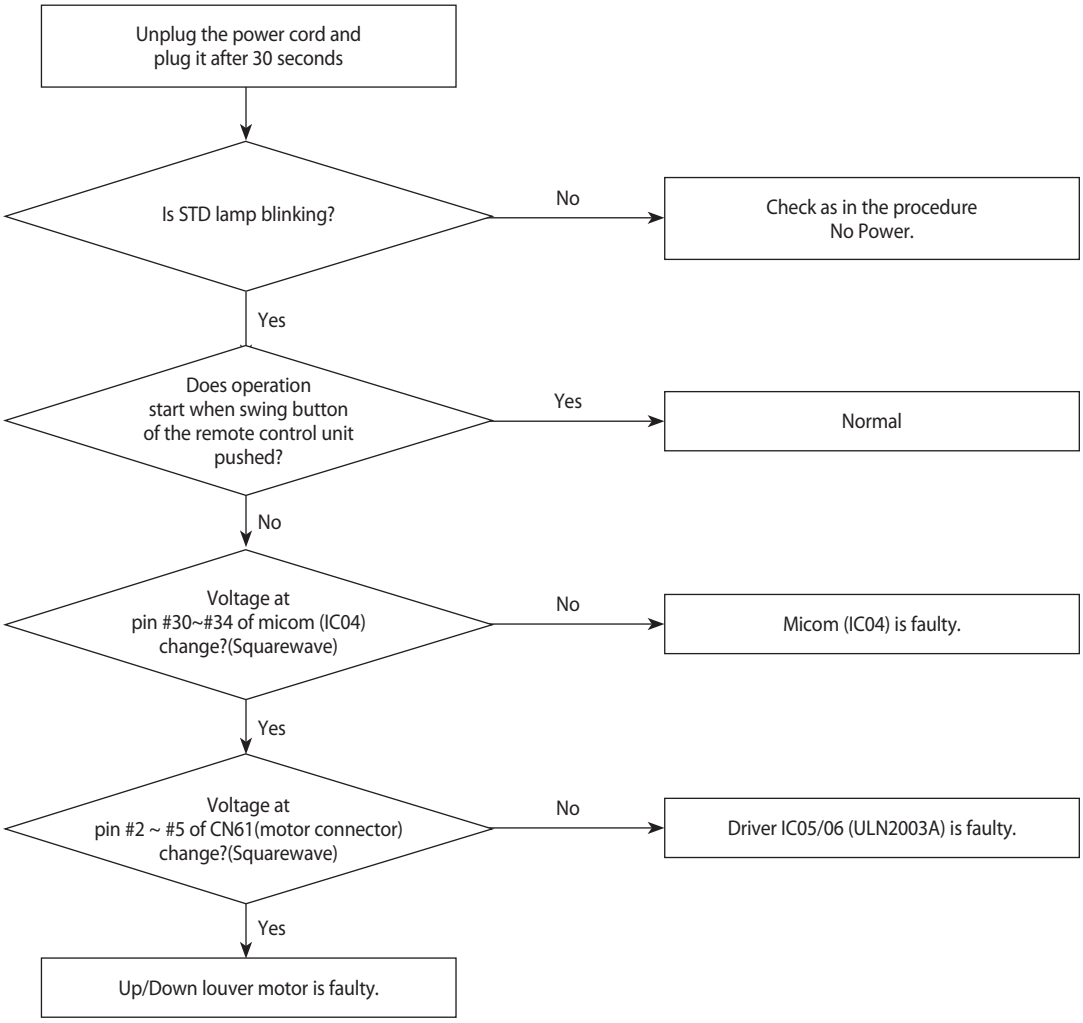
2. Troubleshooting procedure



12-2-3 When the Up/Down Louver Motor Does Not Operate. (Initial Diagnosis)

1. Checklist :
   1) Is input voltage normal?
   2) Is the Up/Down louver motor properly connected with the connector (CN61)?

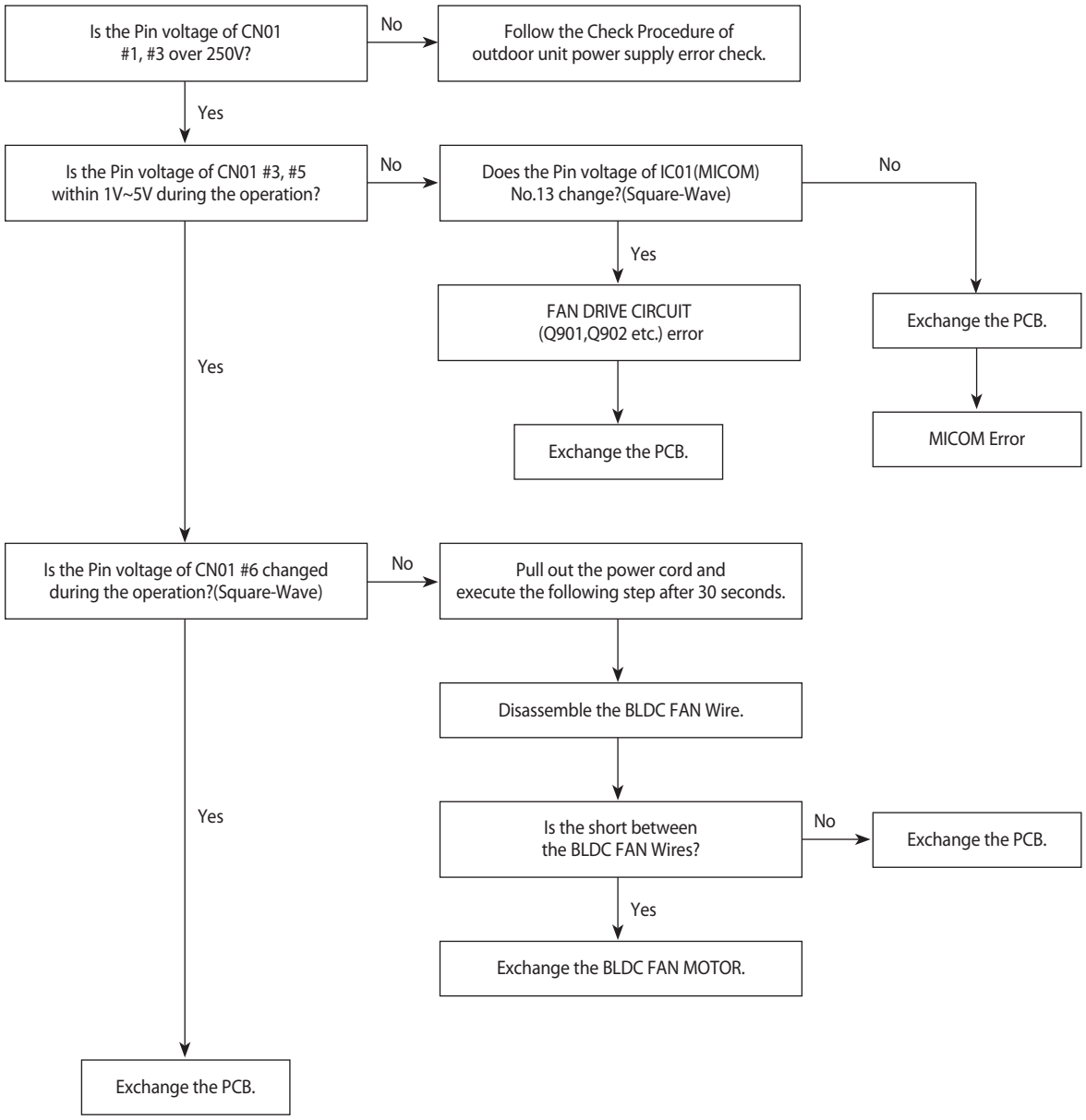
2. Troubleshooting procedure


Unplug the power cord and plug it after 30 seconds
Is STD lamp blinking?
No
Check as in the procedure No Power.
Yes
Does operation start when swing button of the remote control unit pushed?
Yes
Normal
No
Voltage at pin #30~#34 of micom (IC04) change?(Squarewave)
No
Micom (IC04) is faulty.
Yes
Voltage at pin #2 ~ #5 of CN61(motor connector) change?(Squarewave)
No
Driver IC05/06 (ULN2003A) is faulty.
Yes
Up/Down louver motor is faulty.

12-2-4 The Outdoor unit Fan error

1. Checklist :
   1) Are the input power voltage and the power connection correct?
   2) Is the motor wire connected to the outdoor PCB correctly?
   3) Is there no assembly error or none-assembly in the terminal of motor wire connector?
   4) Is there no obstacle at the surrounding of motor and propeller?

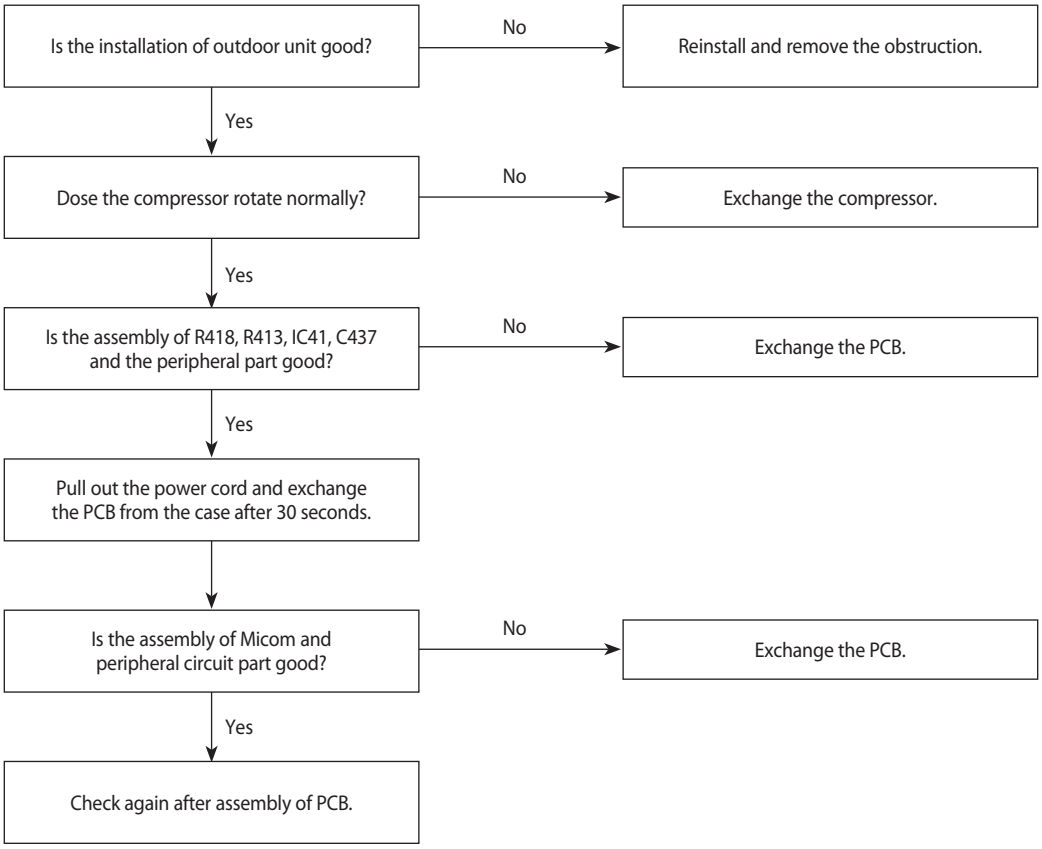
2. Troubleshooting procedure


Is the Pin voltage of CN01 #1, #3 over 250V?
No
Follow the Check Procedure of outdoor unit power supply error check.
Yes
Is the Pin voltage of CN01 #3, #5 within 1V~5V during the operation?
No
Does the Pin voltage of IC01(MICOM) No.13 change?(Square-Wave)
No
Yes
FAN DRIVE CIRCUIT (Q901,Q902 etc.) error
Exchange the PCB.
Exchange the PCB.
MICOM Error
Yes
Is the Pin voltage of CN01 #6 changed during the operation?(Square-Wave)
No
Pull out the power cord and execute the following step after 30 seconds.
Disassemble the BLDC FAN Wire.
Yes
Is the short between the BLDC FAN Wires?
No
Exchange the PCB.
Yes
Exchange the BLDC FAN MOTOR.
Exchange the PCB.

12-2-5 Total current Trip error

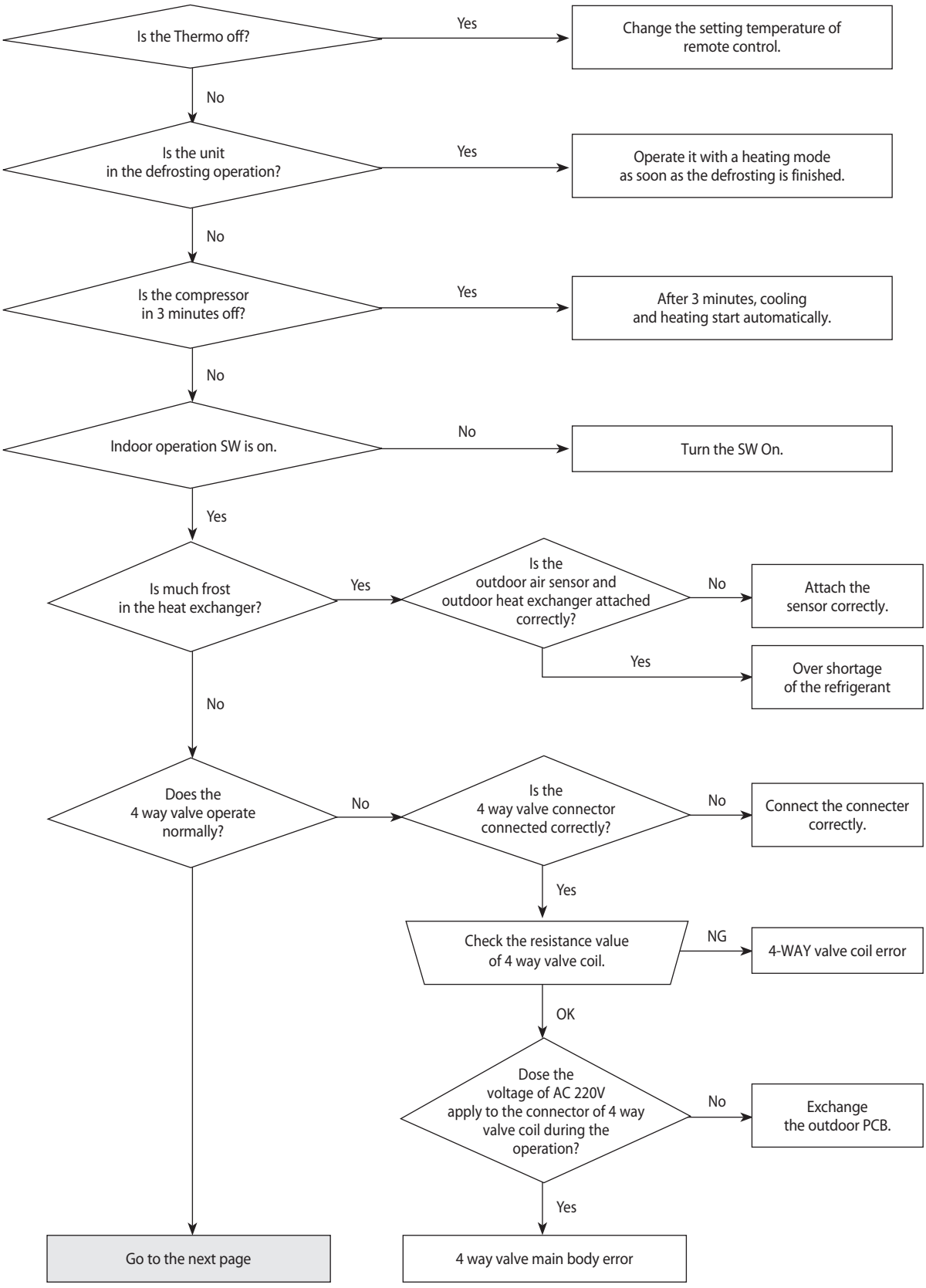
1. Checklist :
   1) Is the input power voltage proper?
   2) Is the refrigerant charged properly?
   3) Does the compressor rotate normally? (Reverse rotation, Locking etc.)
   4) Dose the outdoor fan operate normally? (Fan propeller loss, Motor error etc.)
   5) Is the installation condition of outdoor unit good? (Piping, Space etc.)
   6) Is there no ventilation obstruction at the surrounding of outdoor? (Outdoor unit cover, Fan front obstruction etc.)

2. Troubleshooting procedure

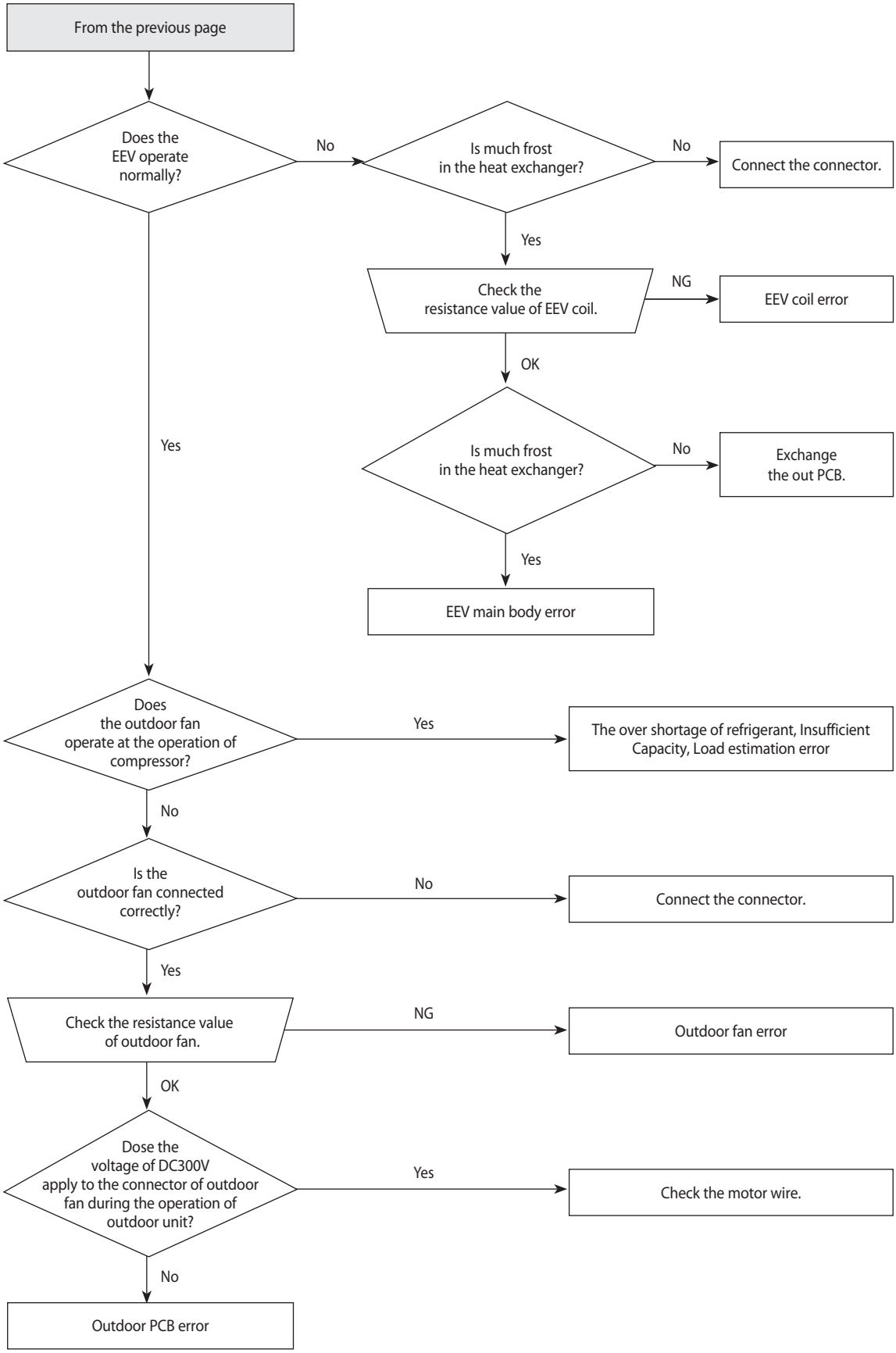

Is the installation of outdoor unit good?
No
Reinstall and remove the obstruction.
Yes
Dose the compressor rotate normally?
No
Exchange the compressor.
Yes
Is the assembly of R418, R413, IC41, C437 and the peripheral part good?
No
Exchange the PCB.
Yes
Pull out the power cord and exchange the PCB from the case after 30 seconds.
Is the assembly of Micom and peripheral circuit part good?
No
Exchange the PCB.
Yes
Check again after assembly of PCB.

12-2-6 In case of heating at the cooling mode or cooling at the heating mode

1. Troubleshooting procedure


Is the Thermo off?
Yes
Change the setting temperature of remote control.
No
Is the unit in the defrosting operation?
Yes
Operate it with a heating mode as soon as the defrosting is finished.
No
Is the compressor in 3 minutes off?
Yes
After 3 minutes, cooling and heating start automatically.
No
Indoor operation SW is on.
No
Turn the SW On.
Yes
Is much frost in the heat exchanger?
Yes
Is the outdoor air sensor and outdoor heat exchanger attached correctly?
No
Attach the sensor correctly.
Yes
Over shortage of the refrigerant
No
Does the 4 way valve operate normally?
No
Is the 4 way valve connector connected correctly?
No
Connect the connecter correctly.
Yes
Check the resistance value of 4 way valve coil.
NG
4-WAY valve coil error
OK
Dose the voltage of AC 220V apply to the connector of 4 way valve coil during the operation?
No
Exchange the outdoor PCB.
Yes
Go to the next page
4 way valve main body error

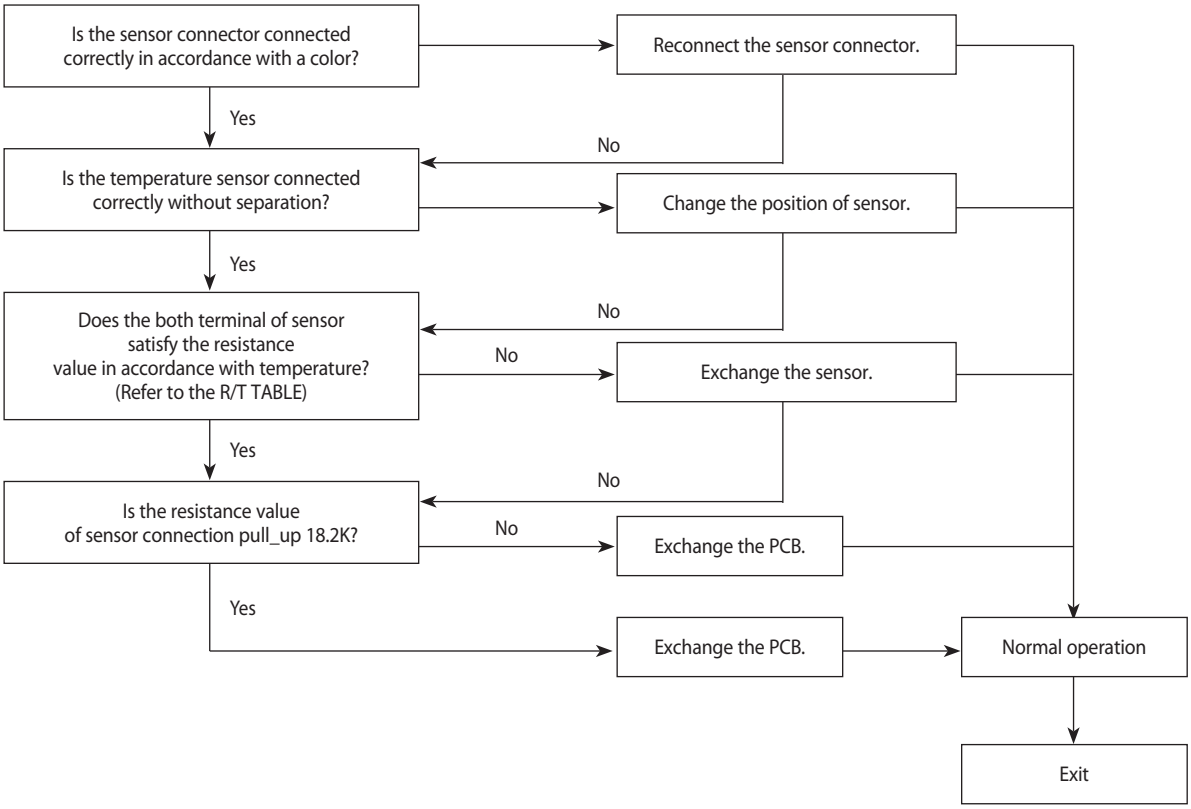
In case of heating at the cooling mode or cooling at the heating mode(cont.)

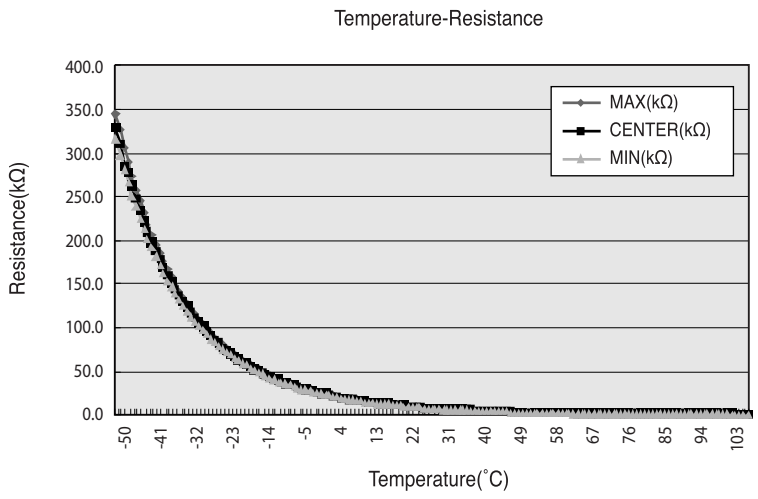


12-2-7 Outdoor temperature sensor error

1. Checklist :
   1) Is the sensor connector connected correctly?
   2) Is the sensor placed correctly?
   3) Does the both terminal of sensor satisfy the resistance value in accordance with temperature?
   4) Is the resistance value of sensor connection pull_up correct?

2. Troubleshooting procedure

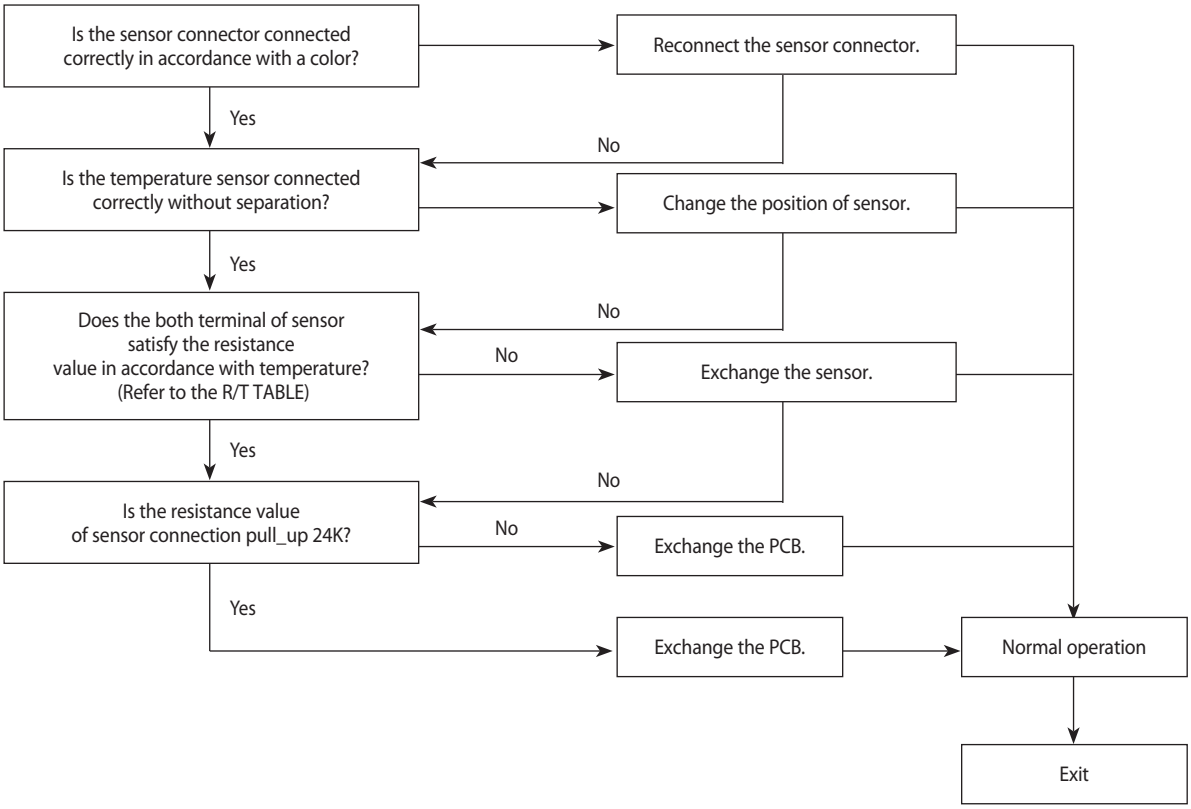


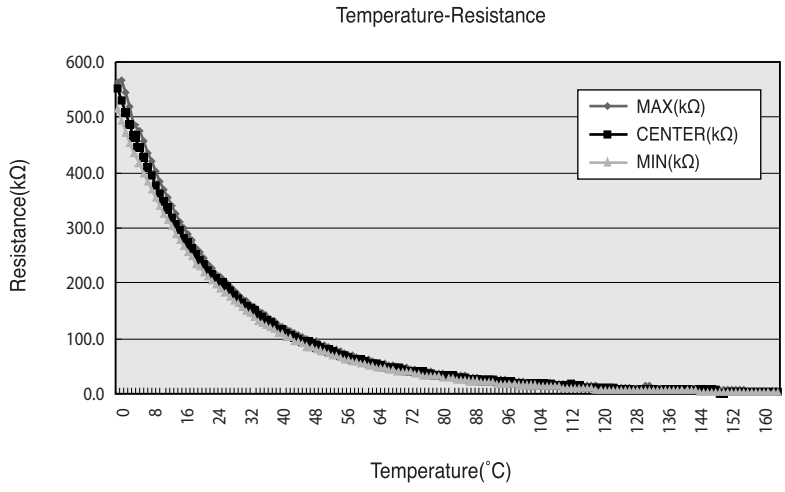


12-2-8 Discharge temperature sensor error

1. Checklist :
   1) Is the sensor connector connected correctly?
   2) Is the sensor placed correctly?
   3) Does the both terminal of sensor satisfy the resistance value in accordance with temperature?
   4) Is the resistance value of sensor connection pull_up correct?

2. Troubleshooting procedure

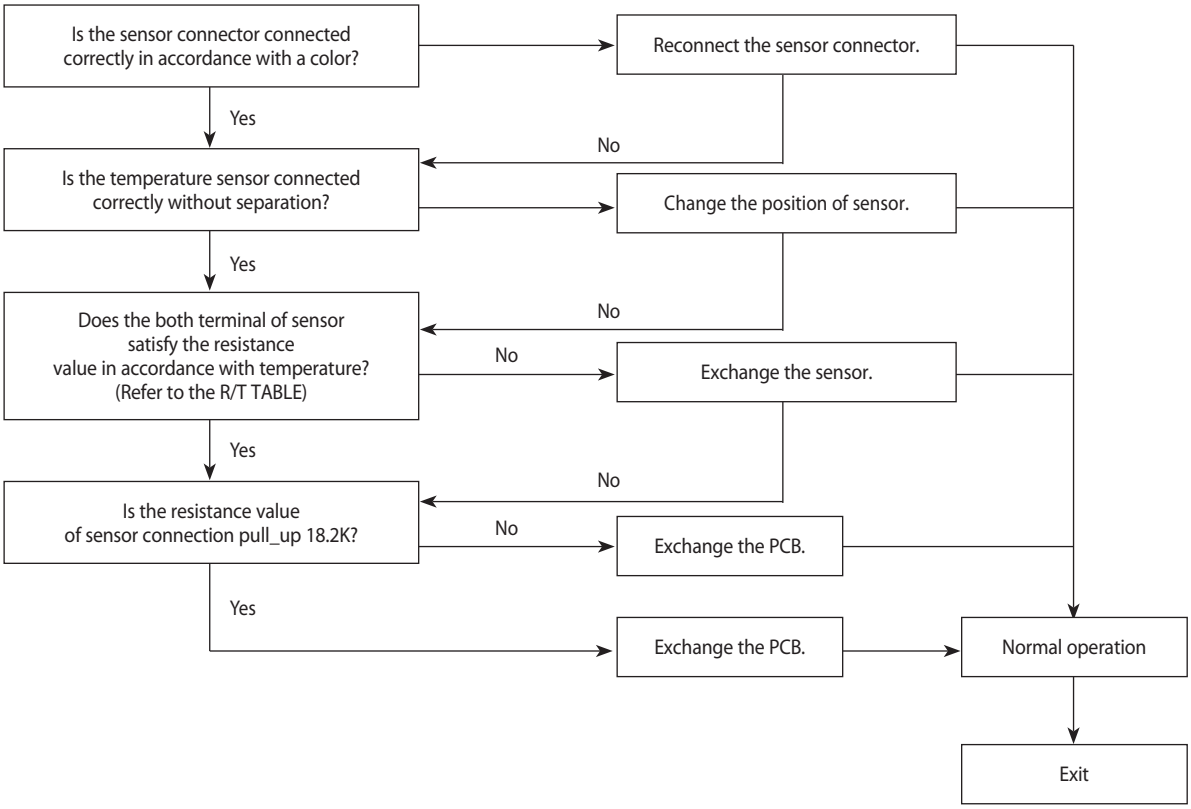


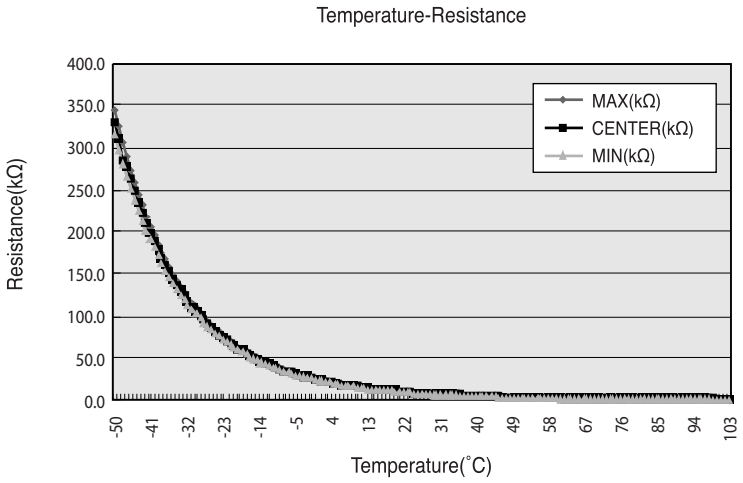


12-2-9 Coil temperature sensor error

1. Checklist :
   1) Is the sensor connector connected correctly?
   2) Is the sensor placed correctly?
   3) Does the both terminal of sensor satisfy the resistance value in accordance with temperature?
   4) Is the resistance value of sensor connection pull_up correct?

2. Troubleshooting procedure

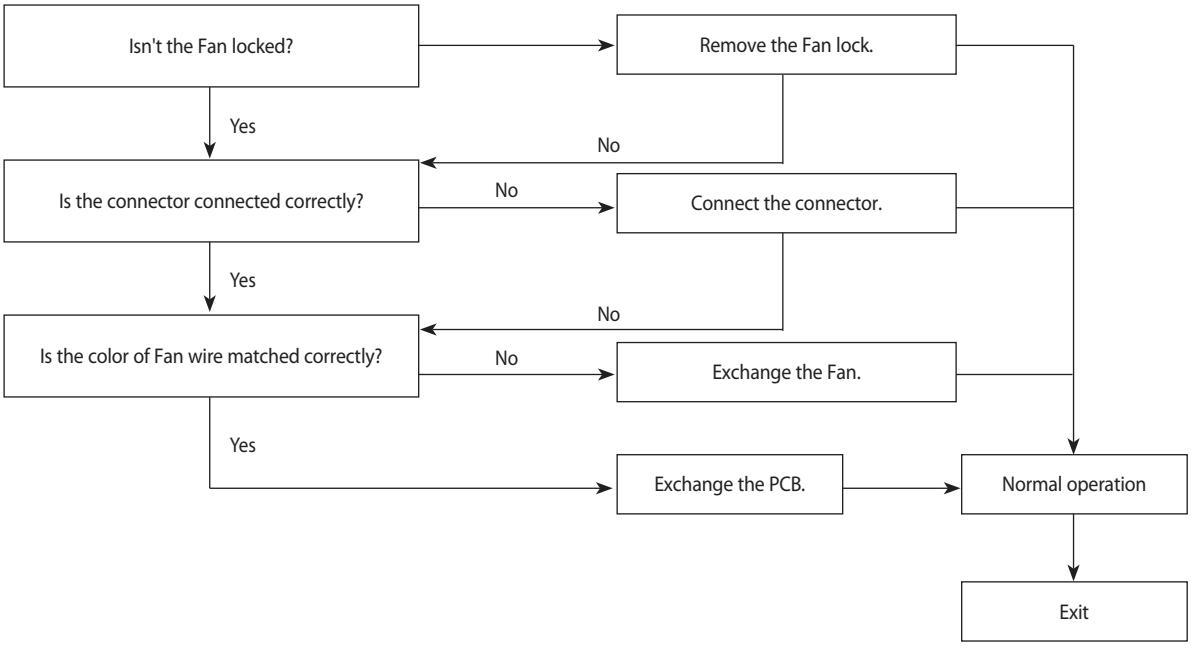




12-2-10 Fan error

1. Checklist :
   1) Isn't the fan locked?
   2) Is the sensor placed correctly?
   3) Does the both terminal of sensor satisfy the resistance value in accordance with temperature?
   4) Is the resistance value of sensor connection pull_up correct?

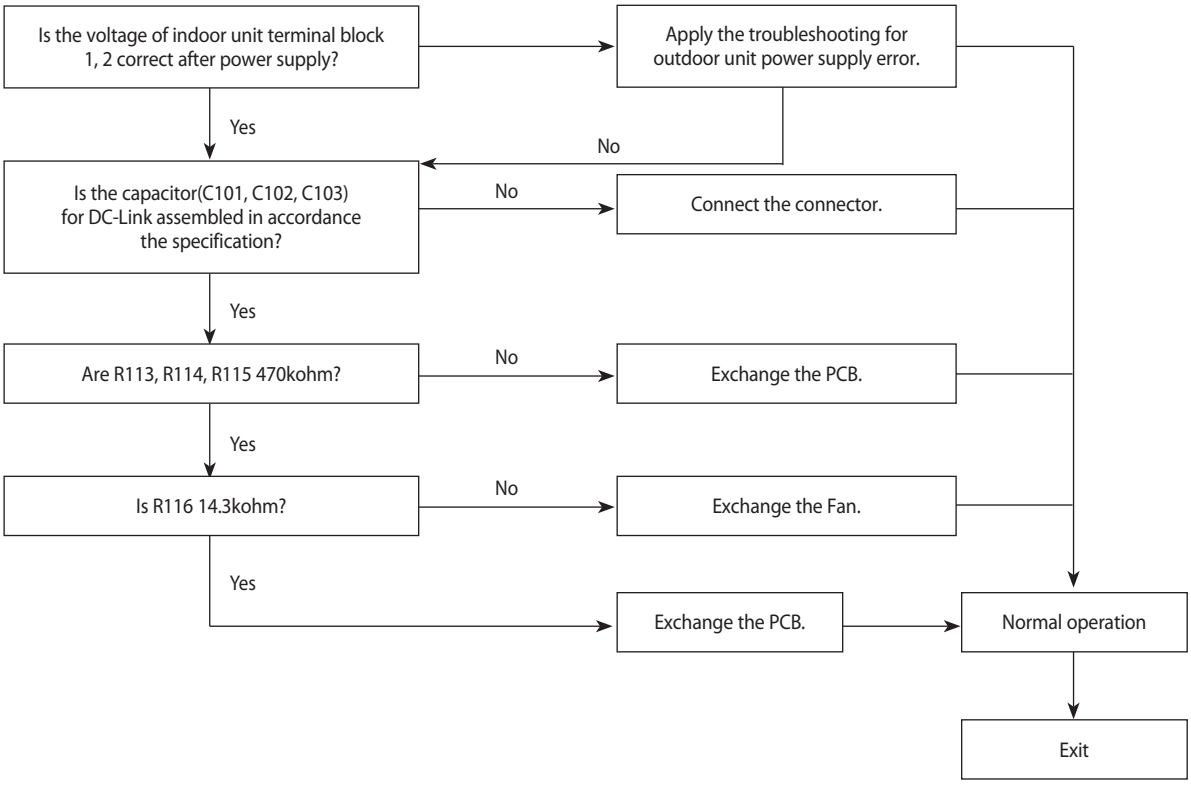
2. Troubleshooting procedure



12-2-11 DC-Link voltage sensor error

1. Checklist :
   1) Is the voltage of indoor unit terminal block 1, 2 correct after power supply?
   2) Is the capacitor(C101, C102, C103) for DC-Link assembled in accordance the specification?
   3) Are R112, R113, R114 470 Kohm?
   4) Is R115 14.3Kohm?

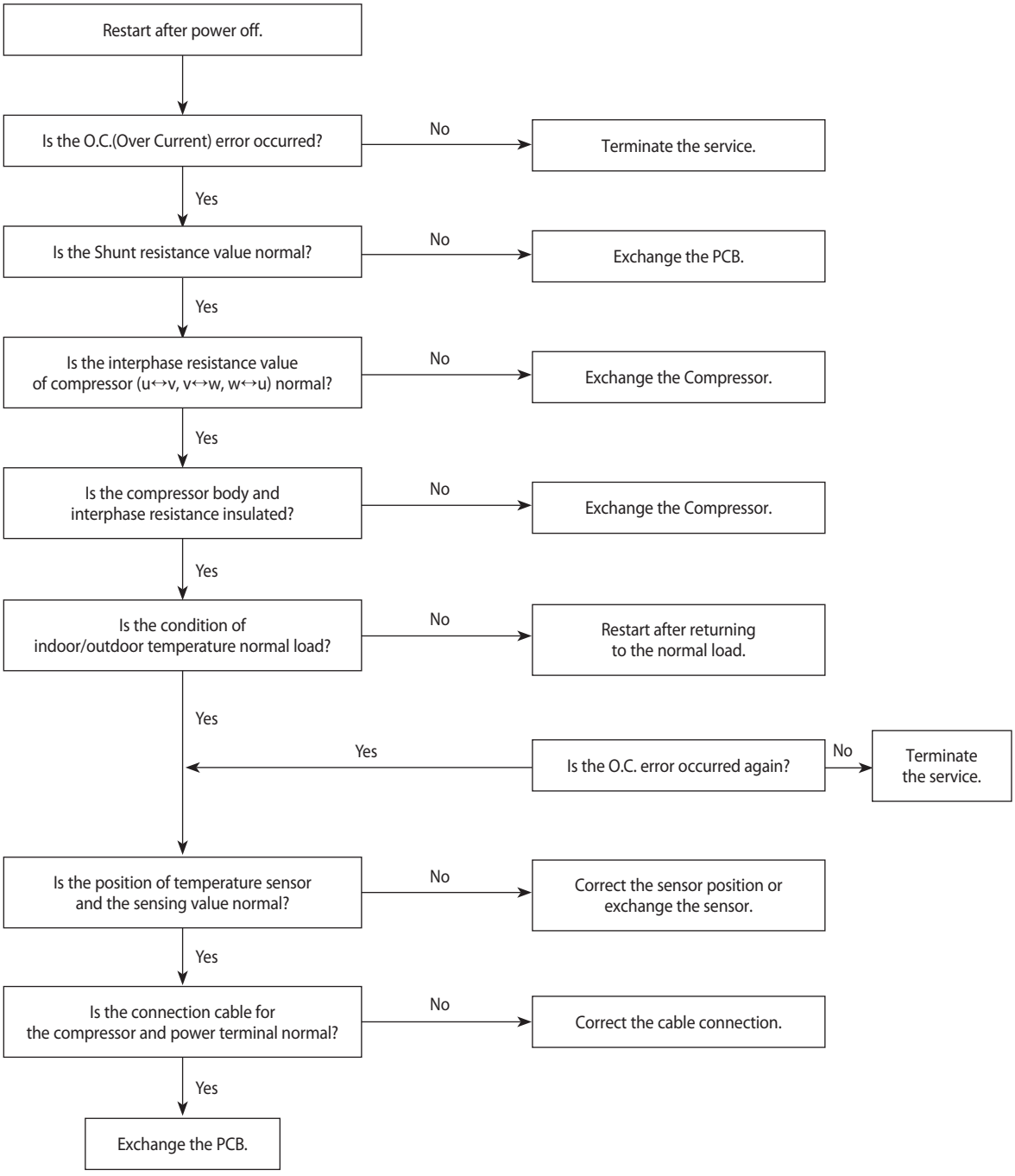
2. Troubleshooting procedure



12-2-12 O.C.(Over Current) error

1. Checklist :
   1) Is the Shunt resistance value correct?
   2) Is the condition of surrounding temperature abnormal overload?
   3) Is there any problem as like the temperature sensor separation or measurement value error?
   4) Is the interphase resistance of compressor normal?

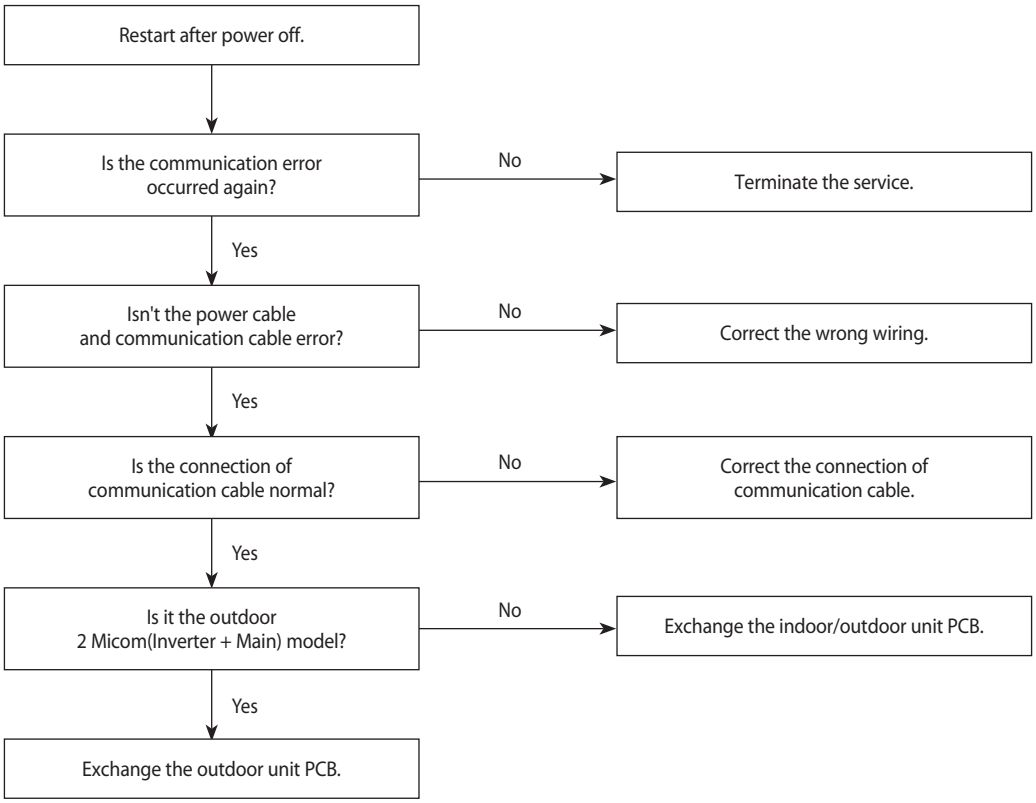
2. Troubleshooting procedure



12-2-13 Communication error

1. Checklist :
   1) Is the communication cable between the indoor unit and outdoor unit connected correctly?
   2) Isn't the power cable and communication cable error?

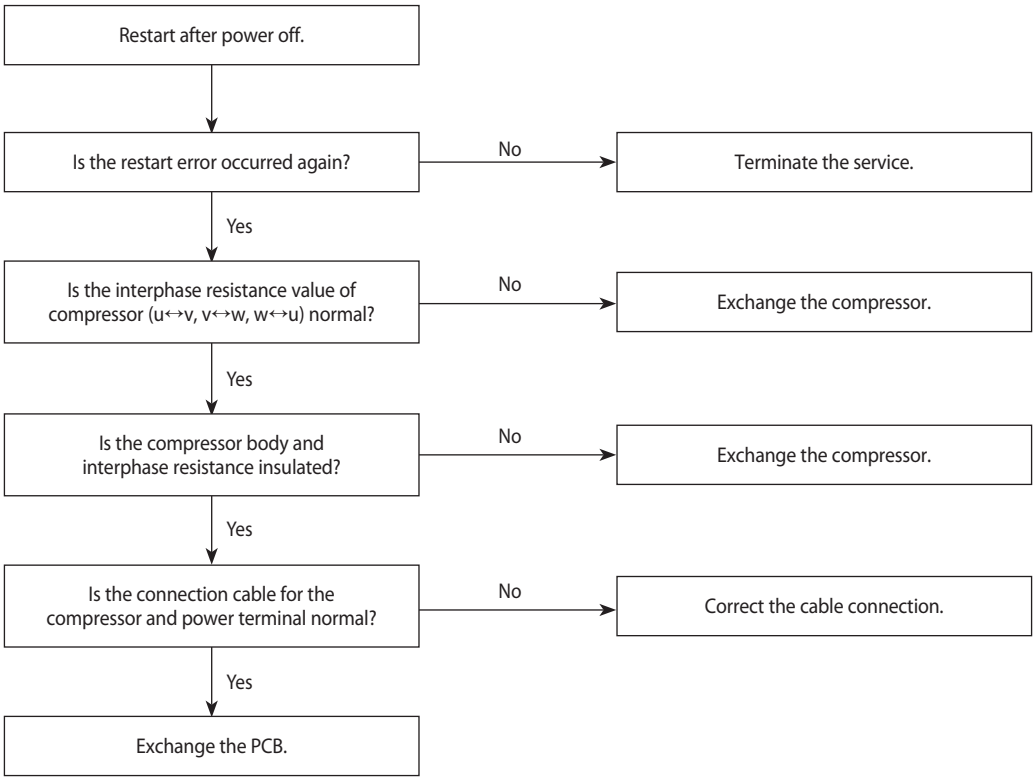
2. Troubleshooting procedure



12-2-14 Compressor start error

1. Checklist :
   1) Is the connection of cable for the compressor and power?
   2) Is the interphase resistance of compressor normal?

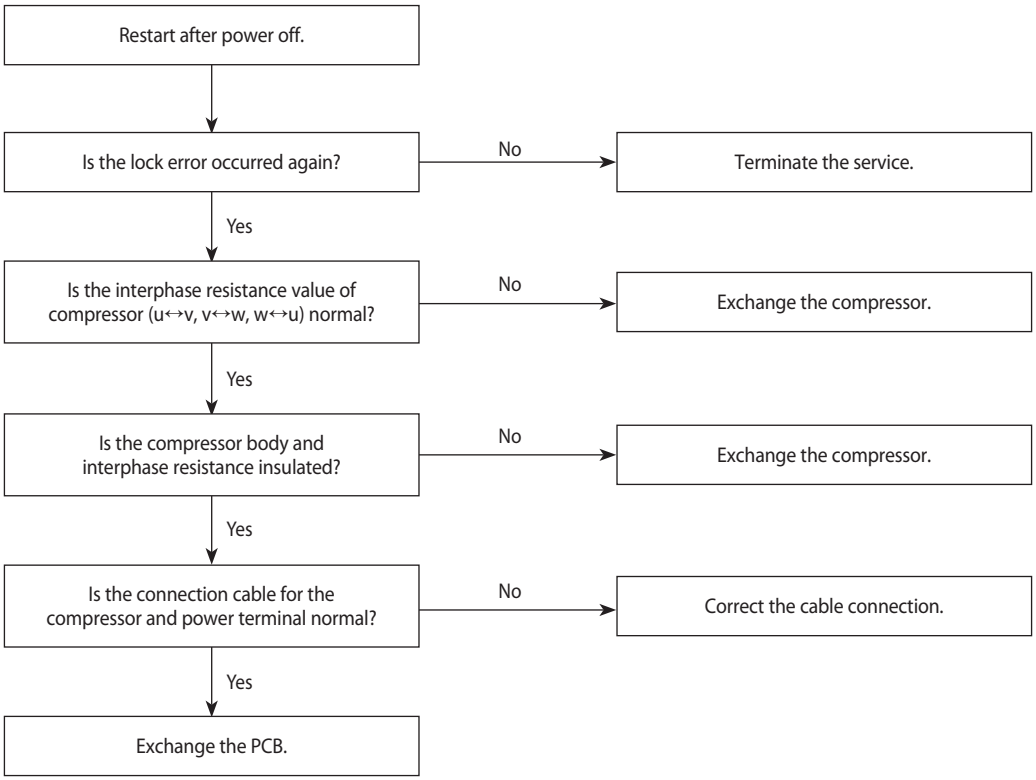
2. Troubleshooting procedure



12-2-15 Compressor lock error

1. Checklist :
   1) Is the connection of cable for the compressor and power?
   2) Is the interphase resistance of compressor normal?

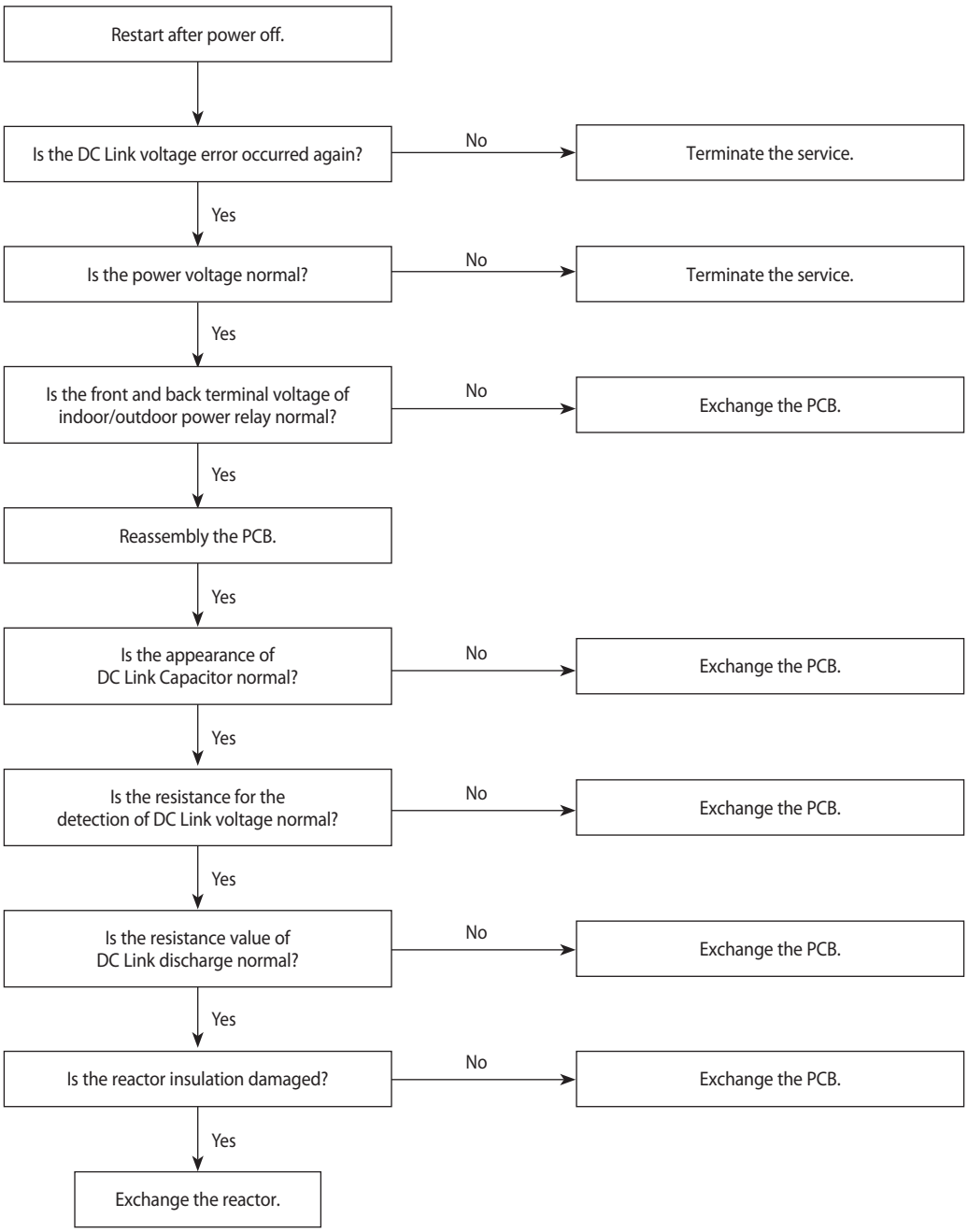
2. Troubleshooting procedure



12-2-16 DC Link Over voltage/ Low voltage error

1. Checklist :
   1) Is the power voltage normal?
   2) Is the voltage of front and back terminal of indoor(outdoor) power relay normal?
   3) Is the resistance value for DC Link voltage detection NORMAL?
   4) Is the resistance value of DC Link discharge normal?
   5) Is the appearance of DC Link Capacitor normal?

2. Troubleshooting procedure



12-2-17 When the remote control is not receiving

1. Check if the connector was normally assembled.

2. Put the set in operation and check the voltage of No. 15(+) and No. 16(-) of the main PCB CN91 while operating the remote control. When the voltage descends below 3V, the assembly module PCB is normal and the main PCB is poor. Then replace the main PCB.

3. Replace the assembly display PCB because the module PCB is poor if the voltage between No. 15~16 of CN91 maintains 5V after the remote control starts operation.

12-2-18 The others

1. AC Line Zero Cross Signal OUT
   – Check the assembly condition of peripheral part of IC21, ZD21, ZD20 and D200 on the PCB.

2. Capacity miss match
   – Check again the indoor unit option code.

12-3 PCB Inspection Method

12-3-1 Pre-inspection Notices

1. Check if you pulled out the AC power plug when you eliminate the PCB or front panel.
2. Don't hold the PCB side not impose excessive force on it to eliminate the PCB.
3. Don't pull the lead wire but hold the whole housing to connect or disconnect a connector to the PCB.
4. In case of outdoor PCB disassembly, check first the complete discharge of condenser (C103) after 30 seconds power off.

12-3-2 Inspection Procedure

1. Check connector connection and peeling of PCB or bronze coating pattern when you think the PCB is broken.
2. The PCB is composed of the 3 parts.
   - Indoor Main PCB Part : MICOM and surrounding circuit, relay, room fan motor driving circuit and control circuit, sensor driving circuit, power circuit of DC12V and DC5V, and buzzer driving circuit.
   - Display part : LED lamp, Switch, Remocon module
   - Outdoor Main PCB part : MICOM and surrounding circuit. IPM and PFC circuit and control circuit.
   - EMI PCB Part : Line filter and Noise Capacitor, Varistor

12-3-3 Indoor Detailed Inspection Procedure

No	Procedure	Inspection Method	Cause
1	Plug out and pull the PCB out of the electronic box. Check the PCB fuse.	1) Is the fuse disconnected?	• Over current • Indoor Fan Motor Short • AC Part Pattern Short of the MAIN PCB
2	Supply power. If the operating lamp twinkles at this time, the above 1)~3) have no relation.	Checking the power voltage.	
		1) Is the DB71 input voltage AC200V~AC240V?	• Power Cord is fault, Fuse open. Wrong Power Cable Wiring, AC Part is faulty.
		2) Is the voltage between both terminals of the C104 on the 2nd side of the transformer DC12V ±0.5V?	• Switching Trans or Power Circuit is faulty
		3) Is the voltage between both terminals of OUT and GND of IC19(KA78L05) DC5V ±0.5V?	• Power Circuit is faulty, Load Short
3	Press the ON/OFF button.	Checking the power voltage.	
		1) Is the voltage over AC180V being imposed on terminal #3 and #5 of the fan motor connector(CN72)?	• Relay(RY71) Coil Disconnection, IC05 is faulty
		2) Check the voltage of both terminals of terminal block 1 and N(1) after 3 minute operation.: AC220V	• Relay(RY71) Contact is faulty
4	Press the ON/OFF button. 1. FAN Speed [High] 2. Continuous Operation	1) Is the voltage over AC180V being imposed on terminal #3 and #5 of the fan motor connector(CN72)?	• Fan Motor of the indoor is faulty
		2) The fan motor of the indoor unit doesn't run.	• Fan Motor Connector(CN72) is faulty
		3) The power voltage between terminal #3 and #5 of the connector(CN72) is 0V.	• ASS'Y Main PCB is faulty • Connection is faulty

12-3-4 Outdoor Detailed Inspection Procedure

No	Procedure	Inspection Method	Cause
1	Wait 30 seconds over after disconnecting the power cable Check the outdoor PCB.	1) Is C101 discharged? 2) Is the resistance of both terminals of C101 opened? 3) Is the fuse of EMI PCB normal? 4) Is the reactor wire connected?	• Over Current • Inner short of PCB • BLDC FAN Motor Error
2	Check the Outdoor unit PCB.	1) Is R701 200ohm? 2) Does ry74 operate normally? (IC05 & 16:0V, 1:5V) 3) Is the fuse(F701) normal? 4) Is the Sub PCB assembled normally?	• Outdoor PCB Error • SUB Relay(RY74) Error • IC05 Error • Indoor PCB Error
3	Check the LED lighting after power supply.	1) Normal: Red: Light On, Green: Flickering, Yellow: Light Off? 2) Is the voltage of C101 250V over? 3) Is the input of IC19 8V, and the output 5V? 4) Recheck after disassembling BLDC FAN Wire.	• Inner short of outdoor PCB • Wrong assembly of outdoor PCB • BLDC FAN Error
4	Check the condition of indoor & outdoor connection cable.	1) Is the green LED light on once per second? 2) Is the indoor & outdoor connection able connected in order? 3) Is the grounding wire connected to the both of indoor & outdoor unit? 4) Is the voltage of terminal block N(1), 225V?	• Wrong connection of Indoor/Outdoor wiring • Wrong assembly of outdoor communication circuit
5	Check the Comp Wire.	1) Is it connected red, blue, and yellow in order in counterclockwise. 2) Are the valve and its installation condition good? 3) Is the installation condition of outdoor unit?	• Wrong assembly • Installation condition is bad.
6	Check the BLDC Fan.	1) Is CN01 1, 3 over 250V? 2) Is CN01 3, 5 within 1V~5V? 3) Is the voltage of CN01 6 changed? 4) Is the resistance of BLDC Motor 1, 3 opened after power off?	• Outdoor PCB Error • BLDC Motor Error

12-4 Main Part Inspection Method

<table>
<tr><th>Part</th><th colspan="2">Breakdown Inspection Method</th></tr>
<tr><td rowspan="3">Room Temperature Sensor</td><td colspan="2">Measure resistance with a tester</td></tr>
<tr><td>Normal</td><td>At the normal temperature 37kΩ~ 8.3kΩ(-7˚C~+30˚C) *Refer to Table 12-3-4.</td></tr>
<tr><td>Abnormal</td><td>∞, 0Ω . . . Open or Short</td></tr>
<tr><td rowspan="3">Room Fan Motor</td><td colspan="2">Measure the resistance between terminals of the connector (CN72) with a tester.</td></tr>
<tr><td>Normal</td><td>At the normal temperature (10˚C ~ 30˚C)
<table>
<tr><th>Compare terminal</th><th>Resistance</th><th>Remark</th></tr>
<tr><td>Yellow, Blue</td><td>404.4Ω ± 10%</td><td>Main</td></tr>
<tr><td>Yellow, Red</td><td>340Ω ± 10%</td><td>Sub</td></tr>
</table></td></tr>
<tr><td>Abnormal</td><td>∞, 0Ω . . . Open or Short</td></tr>
<tr><td rowspan="3">Stepping Motor</td><td colspan="2">Measure the resistance between the red wire and each terminal wire with a tester.</td></tr>
<tr><td>Normal</td><td>About 300Ω at the normal temperature (20˚C ~ 30˚C)</td></tr>
<tr><td>Abnormal</td><td>∞, 0Ω . . . Open or Short</td></tr>
</table>